

AMENDMENTS TO THE CLAIMS

1. (Cancelled) An active implantable medical device comprising:

a first and a second stimulation stage of a cardiac cavity,

said first stimulation stage comprising:

an output capacitor,

a stimulation terminal,

a charging circuit to charge a capacitor to a predetermined stimulation voltage that is near to an effective threshold for stimulation of the patient carrying the device,

a first switch able to connect the output capacitor to the stimulation terminal,

means for performing a capture test able to determine whether a delivered stimulation is effective or there was loss of capture,

means for adjusting the stimulation voltage according to whether a delivered stimulation is effective, and

means for delivering a backup-stimulation after the capture test determined a loss of capture,

said device being further characterized in that the means for delivering a backup-stimulation comprises:

an additional capacitor capable of storing a second predetermined voltage,

a second switch to connect said additional capacitor to discharge said second predetermined voltage to said stimulation terminal,

said additional capacitor further comprising a specific capacitor, distinct from said output capacitor, wherein the charging circuit is able to charge said specific capacitor to said second predetermined voltage, wherein said second predetermined voltage is higher than said first predetermined stimulation voltage, and

said second stimulation stage comprising a second output capacitor and a second stimulation terminal, wherein said specific capacitor further comprises said second output capacitor of said second stimulation stage.

2. (Cancelled) The device of claim 1, in which said additional capacitor further comprises a specific capacitor, distinct from said output capacitor, wherein the charging circuit is able to charge said specific capacitor to said second predetermined voltage, said second predetermined voltage is higher than first predetermined stimulation voltage.

3. (Cancelled) The device of claim 2, further comprising a second stimulation stage having a second output capacitor and a second stimulation terminal, wherein said specific capacitor further comprises said second output capacitor of said second stimulation stage.

4. (Cancelled) The device of claim 1 wherein said first switch connects said specific capacitor in series with said output capacitor.

5. (Cancelled) The device of claim 1, wherein said first stimulation stage is one of an atrial stage and a right ventricular stage, and said second stimulation stage is the other of the atrial stage and the right ventricular stage.

6. (Cancelled) The device of claim 1, wherein said first stimulation stage is one of an atrial stage and a left ventricular stage, and the second stimulation stage is the other of the atrial stage and the left ventricular stage.

7. (Cancelled) The device of claim 1, wherein said first stimulation stage is one of a right ventricular stage and a left ventricular stage, and the second stimulation stage is the other of the right ventricular stage and the left ventricular stage.

8. (Cancelled) The device of claim 1 in which said additional capacitor further comprises an additional capacitor and wherein said charging circuit is coupled to charge said additional capacitor to the second predetermined voltage separately from said output capacitor, and the second switch further comprises means for connecting in series the output capacitor and the additional capacitor during a delivery of backup-stimulation.

9. (Cancelled) The device of claim 8, wherein the charging circuit has a first output and a second output, the device further comprises a ground potential, the output capacitor has a first plate connected to the first output of the charging circuit and to said first switch connected selectively to the stimulation terminal, the output capacitor has a second plate connected to a third switch connected selectively to the ground potential, the additional capacitor has a first plate connected to the second output of the charging circuit and to a fourth switch connected selectively to a second stimulation terminal, and a fifth switch selectively connected to the output capacitor second plate and the additional capacitor first plate.

10. (Cancelled) The device of claim 8, further comprising a second stimulation stage distinct from said first stimulation stage, said second stimulation stage comprising a second output capacitor and a second stimulation terminal, and wherein said additional capacitor comprises said second output capacitor of said second stimulation stage.

11. (Cancelled) The device of claim 10, wherein said first stimulation stage is one of an atrial stage and a right ventricular stage, and said second stimulation stage is the other of the atrial stage and the right ventricular stage.

12. (Cancelled) The device of claim 10, wherein said first stimulation stage is one of an atrial stage and a left ventricular stage, and the second stimulation stage is the other of the atrial stage and the left ventricular stage.

13. (Cancelled) The device of claim 10, wherein said first stimulation stage is one of a right ventricular stage and a left ventricular stage and the second stimulation stage is the other of the right ventricular stage and the left ventricular stage.

14. (Currently Amended) An active implantable medical device comprising:  
a first stimulation stage of a cardiac cavity, said first stimulation stage comprising:  
an output capacitor;  
a stimulation terminal;  
a charging circuit to charge a capacitor to a predetermined stimulation voltage that is near to an effective threshold for stimulation of the patient carrying the device;  
a first switch able to connect the output capacitor to the stimulation terminal;  
means for performing a capture test able to determine whether a delivered stimulation is effective or there was loss of capture;  
means for adjusting the stimulation voltage according to whether a delivered stimulation is effective; and  
means for delivering a backup-stimulation after the capture test determined a loss of capture, said means comprising:

an additional capacitor capable of storing a second predetermined voltage; a second switch to connect said additional capacitor to discharge said second predetermined voltage to said stimulation terminal;

    said additional capacitor further comprising a specific capacitor, distinct from said output capacitor, wherein the charging circuit is able to charge said specific capacitor to said second predetermined voltage, said second predetermined voltage being higher than said first predetermined stimulation voltage;

    a second stimulation stage comprising a second output capacitor and a second stimulation terminal, wherein said specific capacitor further comprises said second output capacitor of said second stimulation stage; and wherein said first switch connects said specific capacitor in series with said output capacitor.

15. (Previously Presented) An active implantable medical device comprising:

    at least a first stimulation stage of a cardiac cavity, said first stimulation stage comprising:

        an output capacitor;

        a stimulation terminal;

        a charging circuit to charge a capacitor to a predetermined stimulation voltage that is near to an effective threshold for stimulation of the patient carrying the device;

        a first switch able to connect the output capacitor to the stimulation terminal;

        means for performing a capture test able to determine whether a delivered stimulation is effective or there was loss of capture;

        means for adjusting the stimulation voltage according to whether a delivered stimulation is effective; and

means for delivering a backup-stimulation after the capture test determined a loss of capture,

    said device being further characterized in that the means for delivering a backup-stimulation comprises:

        a first additional capacitor capable of storing a second predetermined voltage and a second switch to connect said additional capacitor to discharge said second predetermined voltage to said stimulation terminal, wherein said first additional capacitor further comprises a second additional capacitor and wherein said charging circuit is coupled to charge said first additional capacitor to the second predetermined voltage separately from said output capacitor, and the second switch further comprises means for connecting in series the output capacitor and said first additional capacitor during a delivery of backup-stimulation;

        a second stimulation stage distinct from said first stimulation stage, said second stimulation stage comprising a second output capacitor and a second stimulation terminal, and wherein said first additional capacitor comprises said second output capacitor of said second stimulation stage.

16. (Previously Presented) An active implantable medical device comprising:

    at least a first stimulation stage of a cardiac cavity, said first stimulation stage comprising:

        an output capacitor;

        a stimulation terminal;

        a charging circuit to charge a capacitor to a predetermined stimulation voltage that is near to an effective threshold for stimulation of the patient carrying the device;

        a first switch able to connect the output capacitor to the stimulation terminal;

means for performing a capture test able to determine whether a delivered stimulation is effective or there was loss of capture;

means for adjusting the stimulation voltage according to whether a delivered stimulation is effective; and

means for delivering a backup-stimulation after the capture test determined a loss of capture,

said device being further characterized in that the means for delivering a backup-stimulation comprises:

a first additional capacitor capable of storing a second predetermined voltage and a second switch to connect said additional capacitor to discharge said second predetermined voltage to said stimulation terminal, wherein said first additional capacitor further comprises a second additional capacitor and wherein said charging circuit is coupled to charge said first additional capacitor to the second predetermined voltage separately from said output capacitor, and the second switch further comprises means for connecting in series the output capacitor and said first additional capacitor during a delivery of backup-stimulation;

wherein the charging circuit has a first output and a second output, the device further comprises a ground potential, the output capacitor has a first plate connected to the first output of the charging circuit and to said first switch connected selectively to the stimulation terminal, the output capacitor has a second plate connected to a third switch connected selectively to the ground potential, the additional capacitor has a first plate connected to the second output of the charging circuit and to a fourth switch connected selectively to a second stimulation terminal, and a fifth switch selectively connected to the output capacitor second plate and the additional capacitor first plate.

17. (Previously Presented) The device of claim 15, wherein said first stimulation stage is one of an atrial stage and a right ventricular stage, and said second stimulation stage is the other of the atrial stage and the right ventricular stage.

18. (Previously Presented) The device of claim 15, wherein said first stimulation stage is one of an atrial stage and a left ventricular stage, and the second stimulation stage is the other of the atrial stage and the left ventricular stage.

19. (Previously Presented) The device of claim 15, wherein said first stimulation stage is one of a right ventricular stage and a left ventricular stage and the second stimulation stage is the other of the right ventricular stage and the left ventricular stage.

20. (New) An active implantable medical device comprising:  
a first and a second stimulation stage of a cardiac cavity,  
said first stimulation stage comprising:  
an output capacitor,  
a stimulation terminal,  
a charging circuit to charge a capacitor to a predetermined stimulation voltage that is near to an effective threshold for stimulation of the patient carrying the device,  
a first switch able to connect the output capacitor to the stimulation terminal,  
means for performing a capture test able to determine whether a delivered stimulation is effective or there was loss of capture,  
means for adjusting the stimulation voltage according to whether a delivered stimulation is effective, and

means for delivering a backup-stimulation after the capture test determined a loss of capture,

said device being further characterized in that the means for delivering a backup-stimulation comprises:

an additional capacitor capable of storing a second predetermined voltage,

a second switch to connect said additional capacitor to discharge said second predetermined voltage to said stimulation terminal,

said additional capacitor further comprising a specific capacitor, distinct from said output capacitor, wherein the charging circuit is able to charge said specific capacitor to said second predetermined voltage, wherein said second predetermined voltage is higher than said first predetermined stimulation voltage,

said second stimulation stage comprising a second output capacitor and a second stimulation terminal, wherein said specific capacitor further comprises said second output capacitor of said second stimulation stage, and

wherein said first switch connects said specific capacitor in series with said output capacitor.

21. (New) An active implantable medical device comprising:

a first and a second stimulation stage of a cardiac cavity,

said first stimulation stage comprising:

an output capacitor,

a stimulation terminal,

a charging circuit to charge a capacitor to a predetermined stimulation voltage that is near to an effective threshold for stimulation of the patient carrying the device,

a first switch able to connect the output capacitor to the stimulation terminal,

means for performing a capture test able to determine whether a delivered stimulation is effective or there was loss of capture,

means for adjusting the stimulation voltage according to whether a delivered stimulation is effective, and

means for delivering a backup-stimulation after the capture test determined a loss of capture,

said device being further characterized in that the means for delivering a backup-stimulation comprises:

an additional capacitor capable of storing a second predetermined voltage,

a second switch to connect said additional capacitor to discharge said second predetermined voltage to said stimulation terminal,

said additional capacitor further comprising a specific capacitor, distinct from said output capacitor, wherein the charging circuit is able to charge said specific capacitor to said second predetermined voltage, wherein said second predetermined voltage is higher than said first predetermined stimulation voltage,

said second stimulation stage comprising a second output capacitor and a second stimulation terminal, wherein said specific capacitor further comprises said second output capacitor of said second stimulation stage, and

wherein said additional capacitor further comprises an additional capacitor and wherein said charging circuit is coupled to charge said additional capacitor to the second predetermined voltage separately from said output capacitor, and the second switch further comprises means for connecting in series the output capacitor and the additional capacitor during a delivery of backup-stimulation.

22. (New) The device of claim 21, wherein the charging circuit has a first output and a second output, the device further comprises a ground potential, the output capacitor has a first plate connected to the first output of the charging circuit and to said first switch connected selectively to the stimulation terminal, the output capacitor has a second plate connected to a third switch connected selectively to the ground potential, the additional capacitor has a first plate connected to the second output of the charging circuit and to a fourth switch connected selectively to a second stimulation terminal, and a fifth switch selectively connected to the output capacitor second plate and the additional capacitor first plate.

23. (New) The device of claim 21, further comprising a second stimulation stage distinct from said first stimulation stage, said second stimulation stage comprising a second output capacitor and a second stimulation terminal, and wherein said additional capacitor comprises said second output capacitor of said second stimulation stage.

24. (New) The device of claim 23, wherein said first stimulation stage is one of an atrial stage and a right ventricular stage, and said second stimulation stage is the other of the atrial stage and the right ventricular stage.

25. (New) The device of claim 23, wherein said first stimulation stage is one of an atrial stage and a left ventricular stage, and the second stimulation stage is the other of the atrial stage and the left ventricular stage.

26. (New) The device of claim 23, wherein said first stimulation stage is one of a right ventricular stage and a left ventricular stage and the second stimulation stage is the other of the right ventricular stage and the left ventricular stage.